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(54) **PRECIPITATED CALCIUM CARBONATE FROM PULP MILL WASTE HAVING AN IMPROVED BRIGHTNESS, METHOD FOR THE PRODUCTION AND USE THEREOF**

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(58) **Field of Classification Search**

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See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,900,533	A	2/1990	Malden
5,292,365	A	3/1994	Delfosse
5,792,440	A	8/1998	Huege
5,833,747	A	11/1998	Bleakley et al.
5,861,209	A	1/1999	Haskins et al.
6,592,837	B2	7/2003	Denholm et al.
2005/0276897	A1	12/2005	Nover et al.
2010/0000444	A1	1/2010	Constantz et al.

FOREIGN PATENT DOCUMENTS

CN	101326123	A	12/2008
EP	0604095	A1	6/1994
EP	1052227	A2	11/2000
EP	1790616	A1	5/2007
EP	2070578	A1	6/2009
EP	2447213	A1	5/2012
ES	2175072	T3	11/2002

(Continued)

OTHER PUBLICATIONS

International Search Report dated Jun. 22, 2012 for PCT Application No. PCT/EP2012/058432.

Written Opinion of the International Searching Authority dated Jun. 22, 2012 for PCT Application No. PCT/EP2012/058432.

Office Action for Chinese Application No. 201280023400.3.

Office Action for Colombian Application No. 13-269509-4.

European Search Report dated Nov. 11, 2009 for European Application No. 11166216.9.

(Continued)

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(57) **ABSTRACT**

The present invention relates to a process for the production of a precipitated divalent metal ion carbonate product from a divalent metal ion carbonate which was recovered from waste, the precipitated divalent metal ion carbonate product having an improved brightness, the process comprising the steps of: providing a low-purity divalent metal ion carbonate material, the divalent metal ion carbonate material being recovered from waste; calcining the divalent metal ion carbonate material in order to obtain a divalent metal ion oxide; slaking the divalent metal ion oxide in order to obtain an aqueous suspension of a divalent metal ion hydroxide; carbonating the aqueous suspension of the divalent metal ion hydroxide with a carbon dioxide containing compound in order to obtain fine precipitated divalent metal ion carbonate particles; post-treating the fine precipitated divalent metal ion carbonate particles to obtain fine discrete precipitated divalent metal ion carbonate particles; adding the fine discrete precipitated divalent metal ion carbonate particles to an aqueous suspension of divalent metal ion hydroxide that was obtained by slaking high-purity divalent metal ion hydroxide in order to obtain a resulting reaction mixture; and carbonating the resulting reaction mixture in order to obtain the precipitated divalent metal ion carbonate product having an improved brightness.

20 Claims, 4 Drawing Sheets